



The  
Patent  
Office

PCT/GB 00/00344

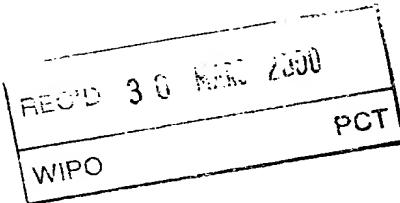


INVESTOR IN PEOPLE

**PRIORITY  
DOCUMENT**

SUBMITTED OR TRANSMITTED IN  
COMPLIANCE WITH RULE 17.1(a) OR (b)

4  
G600/326



The Patent Office  
Concept House  
Cardiff Road  
Newport  
South Wales  
NP10 8QQ

I, the undersigned, being an officer duly authorised in accordance with Section 74(1) and (4) of the Deregulation & Contracting Out Act 1994, to sign and issue certificates on behalf of the Comptroller-General, hereby certify that annexed hereto is a true copy of the documents as originally filed in connection with the patent application identified therein.

In accordance with the Patents (Companies Re-registration) Rules 1982, if a company named in this certificate and any accompanying documents has re-registered under the Companies Act 1980 with the same name as that with which it was registered immediately before re-registration save for the substitution as, or inclusion as, the last part of the name of the words "public limited company" or their equivalents in Welsh, references to the name of the company in this certificate and any accompanying documents shall be treated as references to the name with which it is so re-registered.

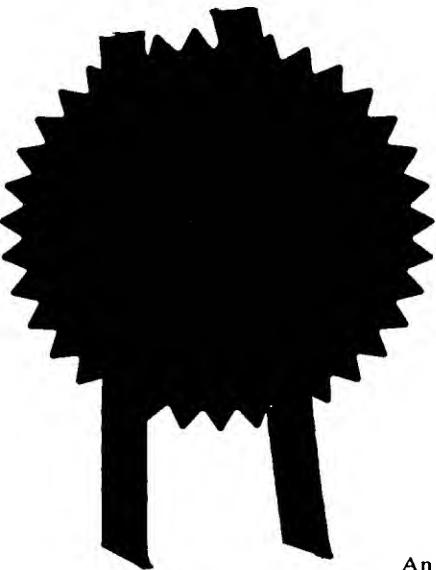
In accordance with the rules, the words "public limited company" may be replaced by p.l.c., plc, P.L.C. or PLC.

Re-registration under the Companies Act does not constitute a new legal entity but merely subjects the company to certain additional company law rules.

Signed

*Anastasiou*

Dated 20 March 2000



This Page Blank (uspto)

THE PATENT OFFICE

- 6 FEB 1999

SEARCHED BY POST

## Request for grant of a patent

(See the notes on the back of this form. You can also get  
an explanatory leaflet from the Patent Office to help  
you fill in this form)

The Patent Office

Cardiff Road  
Newport  
Gwent NP9 1RH

1. Your reference

0121-HL

06 FEB 1999

2. Patent application number

(The Patent Office will fill in this part)

9902556.1

3. Full name, address and postcode of the or of  
each applicant (*underline all surnames*)LINPAC PLASTICS LIMITED  
Al Business Park  
Knotttingley  
West Yorkshire  
WF11 0BS

07632001

Patents ADP number (*if you know it*)If the applicant is a corporate body, give the  
country/state of its incorporation

United Kingdom

4. Title of the invention

Container

5. Name of your agent (*if you have one*)BRITTER AND CO  
Barn West  
Dixies  
High Street  
Ashwell  
Hertfordshire  
SG7 5NTPatents ADP number (*if you know it*)

9951003

6. If you are declaring priority from one or more  
earlier patent applications, give the country  
and the date of filing of the or of each of these  
earlier applications and (*if you know it*) the or  
each application number

Country

Priority application number  
(*if you know it*)Date of filing  
(*day / month / year*)7. If this application is divided or otherwise  
derived from an earlier UK application,  
give the number and the filing date of  
the earlier application

Number of earlier application

Date of filing  
(*day / month / year*)8. Is a statement of inventorship and of right  
to grant of a patent required in support of  
this request? (Answer 'Yes' if:

Yes

- a) any applicant named in part 3 is not an inventor, or
- b) there is an inventor who is not named as an applicant, or
- c) any named applicant is a corporate body.

See note (d))

9. Enter the number of sheets for any of the following items you are filing with this form.  
Do not count copies of the same document

|                                  |    |
|----------------------------------|----|
| Continuation sheets of this form | -  |
| Description                      | 10 |
| Claim(s)                         | 3  |
| Abstract                         | -  |
| Drawing(s)                       | 4  |

10. If you are also filing any of the following, state how many against each item.

|  |   |
|--|---|
| Priority documents   | - |
| Translations of priority documents   | - |
| Statement of inventorship and right to grant of a patent (Patents Form 7/77) | - |
| Request for preliminary examination and search (Patents Form 9/77)           | X |
| Request for substantive examination (Patents Form 10/77)                     | - |
| Any other documents (please specify)   | - |

11.

I/We request the grant of a patent on the basis of this application.

Signature

Date 05.02.99

BRITTER AND CO

12. Name and daytime telephone number of person to contact in the United Kingdom

Keith P Britter - 01462 743000

**Warning**

After an application for a patent has been filed, the Comptroller of the Patent Office will consider whether publication or communication of the invention should be prohibited or restricted under Section 22 of the Patents Act 1977. You will be informed if it is necessary to prohibit or restrict your invention in this way. Furthermore, if you live in the United Kingdom, Section 23 of the Patents Act 1977 stops you from applying for a patent abroad without first getting written permission from the Patent Office unless an application has been filed at least 6 weeks beforehand in the United Kingdom for a patent for the same invention and either no direction prohibiting publication or communication has been given, or any such direction has been revoked.

**Notes**

- If you need help to fill in this form or you have any questions, please contact the Patent Office on 0645 500505.
- Write your answers in capital letters using black ink or you may type them.
- If there is not enough space for all the relevant details on any part of this form, please continue on a separate sheet of paper and write "see continuation sheet" in the relevant part(s). Any continuation sheet should be attached to this form.
- If you have answered 'Yes' Patents Form 7/77 will need to be filed.
- Once you have filled in the form you must remember to sign and date it.
- For details of the fee and ways to pay please contact the Patent Office.

CONTAINERDESCRIPTION

5        This invention relates to a container for use in the storage and/or display of products, such as fresh meat and other types of fresh food product, and is related especially, but not exclusively, to a container which is tray-shaped or dish-shaped and which may be made of a plastics material.

10       There is a wide range of existing tray-shaped containers for the storage and display at point-of-sale for, say, fresh meat. In the simplest form, these are made of a single layer of a solid or cellular plastics material

15       During storage of fresh, meat and other food products, fluids may exude from the foodstuff and seep in to the internal wall of the container causing undesirable discoloration thereof. In these circumstances, some form of absorbent material may be located upon the inner surface of the base of the container to absorb such fluid and to prevent the seepage of the exuded fluid on to the remainder of the container wall structure.

20

25       There have been a number of developments and improvements to separate the absorbent material from the food product being packaged. The absorbent material may be sandwiched between a perforated film or sheet and the base of the container or, in another example, the tray is made of a cellular structure which is capable of absorbing fluid if the surface is perforated. The disadvantages of these developments is that the fluid may seep through the absorbent material or through the cellular foam structure and exude from the open rim or flange of the container.

30       Also, some fresh food products, particularly fresh meat products, are stored and displayed at point-of-sale in containers of the type in question with

a prescribed atmosphere of gas, such as oxygen and carbon dioxide, depending on established practice in modified atmosphere packaging of fresh food products, in which case, the container has to have its normally open top closed and sealed to the rim of the container by means of, for example, a transparent 5 barrier film.

Containers for this use are made from plastics materials which have at least one layer which is an impermeable fluid barrier. This is normally on the inner surface of the container. It is obvious that if this surface is perforated in 10 order to allow juices or liquids, which exude from the packaged foodstuff, to be absorbed on an absorbent material or cellular structure within the base or wall of the container, then the modified gas atmosphere can escape from the container by the same route.

15 It is an object of the present invention to provide a container which overcomes, or at least substantially reduces, the disadvantages associated with the known types of container, particularly those used for the storage of fresh meat and other food products, as discussed above.

20 Accordingly, one aspect of the invention resides in a container, preferably of tray or dish-like shape, comprising a porous wall structure having at least a portion thereof defining at least part of a space which is sealed in a fluid-tight manner from the remainder of the wall structure.

25 By "porous wall structure" is meant, throughout this specification, a wall structure through whose thickness a fluid, namely a gas or liquid, is capable of migrating or otherwise flowing; for example, a wall structure of cellular material of open cell structure or a double wall structure with a gap or other free space between its inner and outer walls.

Preferably, the defined space is sealed from the remainder of the container wall structure by conventional techniques, to provide, for example, a continuous space-defining seal between the inner and outer surfaces of the wall structure across the thickness thereof. Also, the space is preferably 5 provided in a base wall of the container wall structure

The space may be filled by the material from which the container wall structure is made by, say thermoforming; for example, a cellular material, such 10 as expanded polystyrene, of open cell structure which can preferably absorb a fluid. If, say, the inner surface of the wall structure is provided with an impermeable, fluid barrier film layer, then that layer, in the region of the space, may be perforated to permit fluid in the container to seep or otherwise pass into the space where it can be absorbed by the material of the wall structure or other absorbant material located in the space.

15

In this manner, any fluid such as blood or other fluid exuding from, say, a fresh meat product which is stored and displayed within the container and which migrates into the space defined within the wall structure, is prevented from migrating or otherwise passing further into the thickness of the 20 remainder of the container wall structure.

Similarly, any gas(es), provided as prescribed atmosphere within the container and retained therein by an impervious, gas barrier film as a closure for the container, which migrates into the space defined within the container 25 wall structure, usually via perforations in an impermeable, gas barrier sheet layer on the inner surface of the wall structure, is prevented from migrating further through and along the thickness of the wall structure and escaping from the container via the exposed open edge of the wall structure at the rim or peripheral flange of the container.

30

With a container of double wall structure, namely spaced inner and outer walls, one of these walls may be sealed to the other by suitable shaping thereof to define the fluid-tight space. For example, the outer wall may have a closed, continuously extending ridge or castellation which projects inwardly of and across the gap between the inner and outer walls and which is sealed to the inner wall. The so-defined space, which is sealed from the remainder of the container wall structure in a fluid-tight manner, may be empty or at least partially filled with, say, an absorbent material, in which case, the inner wall in the region of the space may be perforated.

10

In any event, any fluid seeping or otherwise passing into the fluid-tight space, is prevented from passing into the remainder of the container wall structure, namely, between the inner and outer walls thereof.

15

In accordance with a second aspect of the invention, there is provided a container whose wall structure comprises a portion thereof which at least partially defines a space whose volume is substantially separated, in a fluid-tight manner, from the remaining volume of the container.

20

Such a space may be at least partially defined by suitable shaping of the wall structure to form a recessed area and, if necessary, provide a closure therefor.

25

In an embodiment of container in accordance with the second aspect of the invention, the base wall of the wall structure has an internal or external recess closed, in a fluid-tight manner, by a closure of the same or a similar material to that of the container, for example, fluid barrier coated cellular material, such as expanded polystyrene, or a rigid or semi-rigid plastics material. The inner side of the space, usually constituted by any closure when the recessed area is internal of the container or by the inverted base wall of the recessed area when such is external of the container, may be perforated to

30

allow any fluid within the container to enter the so-defined space for retention therein. Such fluid retention may be provided by an absorbant material at least partially filling the space.

5        Further, the container may be closed from the atmosphere by a suitable closure, for example, an impervious gas barrier film sealed to the peripheral rim of the container.

10      As indicated above, an absorbent pad or sheet may be located on the inner base wall of a container or within the thickness of the base wall of the wall structure thereof, to absorb any liquid, such as blood, exuding from, say, a fresh meat product stored in the container. Known absorbent pads or sheets of this type are generally made of a fibrous material. However, a third aspect of the invention resides in an absorbent element, generally planar, for use as 15 an absorbing medium in a fresh food container, which element comprises a cellular material of open cell structure. Preferably, the cellular material is a cellular plastics material of open cell structure, for example, expanded polystyrene. The absorbent element in accordance with the third aspect of the invention may be adapted to be located upon a base wall of the wall structure 20 of an associated interior of a container or to be located within the thickness of the base wall thereof.

25      In this manner, a container of a cellular plastics structure with closed or open cell structure, such as expanded polystyrene, may be supplied with an absorbent element in accordance with the third aspect of the invention, thereby providing a container assembly which is all plastic, of low weight and recyclable, to comply with packaging waste regulations.

30      Embodiments of container in accordance with the various aspects of the invention will now be described by way of example and with reference to the accompanying drawings in which:

Figure 1 is a bottom plan view of a first embodiment of container;

5 Figure 2 is a section along the line II-II in Figure 1;

Figure 3 is a sectional end view of a second embodiment of container;

10 Figure 4 is a sectional end view of a third embodiment of container;

Figure 5 is a sectional end view of a fourth embodiment of container.

10

Referring firstly to Figures 1 and 2 of the drawings, a rectangular, tray-shaped container thermoformed from open cell expanded polystyrene sheet, as indicated generally at 1, has a porous wall structure comprising a base wall 12, a continuous, tapered side wall 13 upstanding therefrom and an outwardly 15 extending peripheral rim 14. The inner and outer surfaces of the wall structure have thereon respective impermeable, fluid barrier film layers 15 and 18.

20

The inner layer 15 on the base wall 12 of the container 1 is perforated, in a regular array of perforations, as shown at 16, to allow any excess blood and/or other fluids exuding from a fresh meat product placed on the base wall 12 of the container 1, to pass into the thickness of the base wall 12 for absorption therein. As discussed above, an absorbent element, preferably in the form of a sheet or pad in accordance with the third aspect of the invention, embedded within the thickness of or located upon the base wall 12 of the 25 container 1, may be used alternatively or additionally.

30

At least the major portion of the base wall 12 of the container 1 is sealed, in a fluid type manner at 17, from the remainder of the wall structure of the container 1 to define a space 100 sealed from the remainder of the wall structure. In this manner, any liquid such as blood and/or any other exuded fluids, absorbed in that sealed space 100 of the base wall 12, is unable to

5 migrate into the thickness of the remainder of the wall structure of the container 1, thereby preventing, or at least substantially reducing, any undesirable discoloration of the remainder of the wall structure and eliminating any seepage of the liquid from the open flange or rim 14 of the container 1.

10 As seen in Figure 1, the seal 17 is continuous and generally rectangular in plan, following the profile of the rectangular base wall 12, of the container 1. That seal 17, which is effectively represented by the bringing together, in a fluid-type manner, of the outer surface and inner surface of the base wall 12, such being formed by conventional thermoforming techniques.

15 If needs be, the container 1 may be closed, with the associated fresh meat product (not shown) contained therein, by means of a transparent, impervious, fluid barrier film 19 sealed to the rim or peripheral flange 14 of the container 1.

20 Thus, any modified atmosphere of, say, oxygen and carbon dioxide gases, within the sealed container 1, is retained therein, as any of the gas(es) is prevented from migrating into and through the thickness of the remainder of the wall structure and escaping from the exposed free edge of the peripheral flange or rim 14.

25 In use of the container 1, any blood or other fluids exuding from a fresh meat product placed upon the inner surface layer 15 of the base wall 12 of the container 1 will be absorbed into the space defined within the thickness of the base wall 12 but filled with absorbent material from which the container has been thermoformed, is unable to seep into the remainder of the wall structure, due to the continuous seal 17, as discussed above. Thus, undesirable 30 discoloration of the remainder of the wall structure and loss of any modifying gas(es) are eliminated or substantially reduced.

Referring now to the second embodiment shown in Figure 3, here the container, indicated generally at 3, has a porous wall structure comprising respective inner and outer walls provided by corresponding inner and outer rigid or semi-rigid plastics shells indicated at 31 and 32, respectively. Thus,  
5 the porous double wall structure of the tray-shaped container 3 comprises respective inner and outer base walls 33, 34 and upstanding therefrom respective inner and outer continuous, tapered side walls, 35, 36, with corresponding peripheral rims 37, 38 preferably sealed together at their adjacent confronting surfaces.

10

The outer base wall 34 is provided with a continuously-extending, inwardly projecting ridge or castellation 39 whose inner and upper surface is in sealing engagement, in a fluid-tight manner, with the abutting lower surface of the inner base wall 33. In this manner, the spacing between the inner and 15 outer walls 31, 32 of the container 3 is maintained substantially constant, whilst the space 300 defined between the respective portions of the inner and outer base walls 33, 34 and castellation 39, is sealed, in fluid-type relationship, with respect to the remainder of the wall structure of the container 3. Within 20 that space is provided an absorbent material 303, preferably in pad or sheet form, each as an absorbent element in accordance with the third aspect of the invention defined above.

Thus, and as a consequence of the continuous castellation 39 being sealed to the base wall 33 of the inner container shell 31, fluid received via 25 perforations 336 in the inner wall 31 and absorbed within the defined space 300 cannot pass into any part of the remainder of the container wall structure.

In Figure 4, an embodiment of container in accordance with the second aspect of the invention, which may be made from any suitable material, such 30 as, a cellular material with a closed cell structure or an open cell structure with a fluid barrier film layer on at least the inner surface thereof, or a rigid or

semi-rigid plastics material, comprises a base wall 42, a tapered, continuous side wall 43 upstanding therefrom and an outwardly projecting peripheral rim 44.

5        The base wall 42 includes a continuous ridge or castellation 49 upstanding therefrom, which at least partially defines a recessed space 400. That space 400 is defined further by a generally planar closure 46 whose periphery is sealed in a suitable manner, for example, by adhesive or thermal bonding, to the upper surface of the upstanding portion of the castellation 49.  
10      Such a closure 46 may be of any suitable shape, for example, planar or corrugated

15      The closure 46 may be made from the same material as that of the wall structure of the container 4 or any other suitable material. Also, that closure 46 may be made of a material through which fluid from, say, a fresh meat product placed thereon, can seep into the space 400. Additionally or alternatively, the closure 46 may be perforated to enhance such seepage. Also, the space 400 may be at least partially filled with an absorbent material, as may be the space 300 of the embodiment of Figure 3.

20      In any event, the sealing of the closure 46 to the upper surface of the continuous castellation 49 in a fluid tight manner prevents any fluid from the space 400 coming in contact with the interior of the remainder of the wall structure of the container 4.

25      Another embodiment of container 5, in accordance with the second aspect of the invention, is illustrated in Figure 5, wherein its centrally-raised base wall 52 at least partially defines a recessed space 500 which is closed, and thus further defined, by a closure 56 whose periphery is sealed, in a fluid type manner to the outer surface of a lower peripheral portion 59 of the base  
30

wall 52 of the container 5. Again, that closure 56 may be planar, corrugated or of any other suitable shape.

The closure 56 may be made of the same material as that of the 5 remainder of the wall structure of the container 5 but the recessed base wall 52 may be perforated, to allow any fluid, such as blood, from, say, a fresh meat product placed thereon, to seep into the space 500 which may be at least partially filled with an absorbent material, such as an absorbent element in accordance with the third aspect of the invention.

10

Again, in this embodiment the so-defined space 500 is sealed in a fluid type manner from the remainder of the wall structure of the container 5.

Thus, it can be seen that both aspects of the invention provide 15 containers which include spaces which are at least partially defined by their respective wall structures and which are sealed, in a fluid-tight manner, from the remainder of their wall structures, to prevent any fluid from spreading therein to or into the remainder of the container, as the case may be, thereby avoiding, or at least substantially reducing, any undesirable discoloration of 20 the wall structure. Further any gas migration along the thickness of the wall structure is at least partially reduced and, in certain circumstances, eliminated.

It is to be appreciated that, although the embodiments of container 25 described above are generally tray-shaped the invention can embody any other shape of container having a porous wall structure.

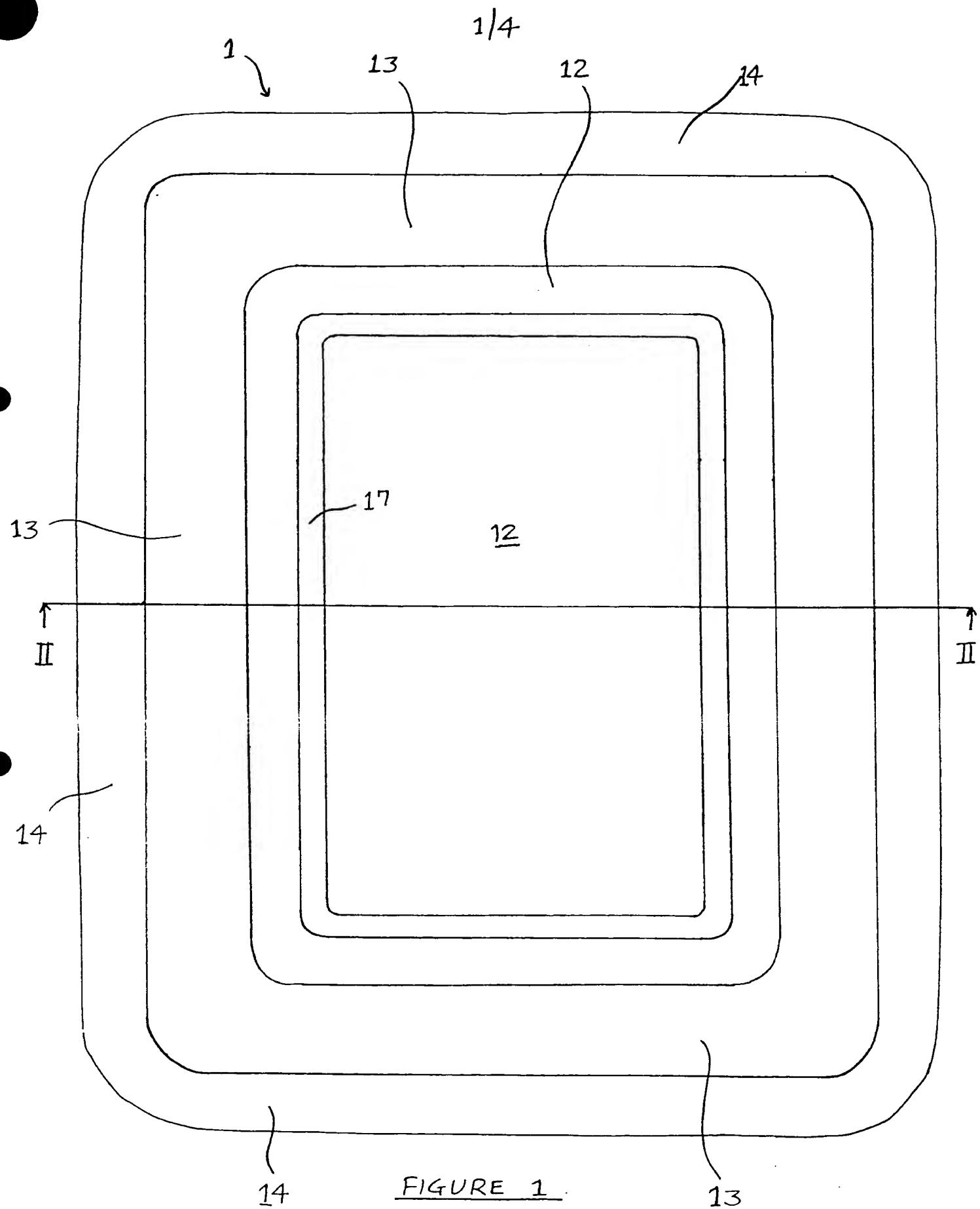
CLAIMS

1. A container, preferably of tray or dish-like shape, comprising a porous wall structure having at least a portion thereof defining at least part of a space which is sealed in a fluid-tight manner from the remainder of the wall structure.  
5
2. A container according to claim 1, wherein the defined space is sealed from the remainder of the container wall structure to provide a continuous space-defining seal between the inner and outer surfaces of the wall structure across the thickness thereof.  
10
3. A container according to claim 1 or 2, wherein the space is provided in a base wall of the container wall structure.  
15
4. A container according to claim 1, 2 or 3, wherein the space is filled by the material from which the container wall structure is made.
20. A container according to any preceding claim, wherein the material from which the container wall structure is made is a cellular material, preferably of open cell structure.
25. A container according to any preceding claim, wherein the inner surface of the wall structure is provided with an impermeable, fluid barrier film layer.
30. A container according to claim 6, wherein the layer, in the region of the space, is perforated.

8. A container according to any preceding claim, wherein the space is at least partially filled with an absorbent material
9. A container according to claim 1 comprising a double wall structure having spaced inner and outer walls, of which one is sealed to the other to define the fluid-tight space.
10. A container according to claim 9, wherein one wall has a closed, continuously extending ridge or castellation which projects inwardly of and across the gap between the inner and outer walls and which is sealed to the other wall.
11. A container according to claim 9 or 10, wherein the so-defined space, which is sealed from the remainder of the container wall structure in a fluid-tight manner, is empty of or at least partially filled with an absorbent material.
12. A container according to claim 9, 10 or 11, wherein the inner wall in the region of the space is perforated.
13. A container having a wall structure comprising a portion thereof which at least partially defines a space whose volume is substantially separated, in a fluid-tight manner, from the remaining volume of the container.
14. A container according to claim 13, wherein the so-defined space is at least partially defined by the shape of the wall structure to form a recessed area and is provided with a closure therefor.
15. A container according to claim 13 or 14, wherein the base wall of the wall structure has an internal or external recess closed, in a fluid-tight manner, by a closure of the same or a similar material to that of the container.

16. A container according to claim 13, 14, or 15, wherein the inner side of the space is perforated to allow any fluid within the container to enter the space for retention therein.
- 5 17. A container according to any of claims 13 to 16 including an absorbent material at least partially filling the space.
- 10 18. A container according to any preceding claim closed from the atmosphere by an impervious gas barrier film sealed to the peripheral rim of the container.
19. A container substantially as hereinbefore described with reference to the accompanying drawings.
- 15 20. An absorbent element for use as an absorbing medium in a fresh food container, which element comprises a cellular material of open cell structure.
21. An element according to claim 20, wherein the cellular material is a cellular plastics material of open cell structure.
- 20 22. An element according to claim 20 or 21 adapted to be located upon a base wall of the wall structure of an associated interior of a container or to be located within the thickness of the base wall thereof.
- 25 23. In combination, a container according to any of claims 1 to 18 and an absorbent element according to claim 20, 21 or 22.

This Page Blank (uspto)



This Page Blank (uspto)

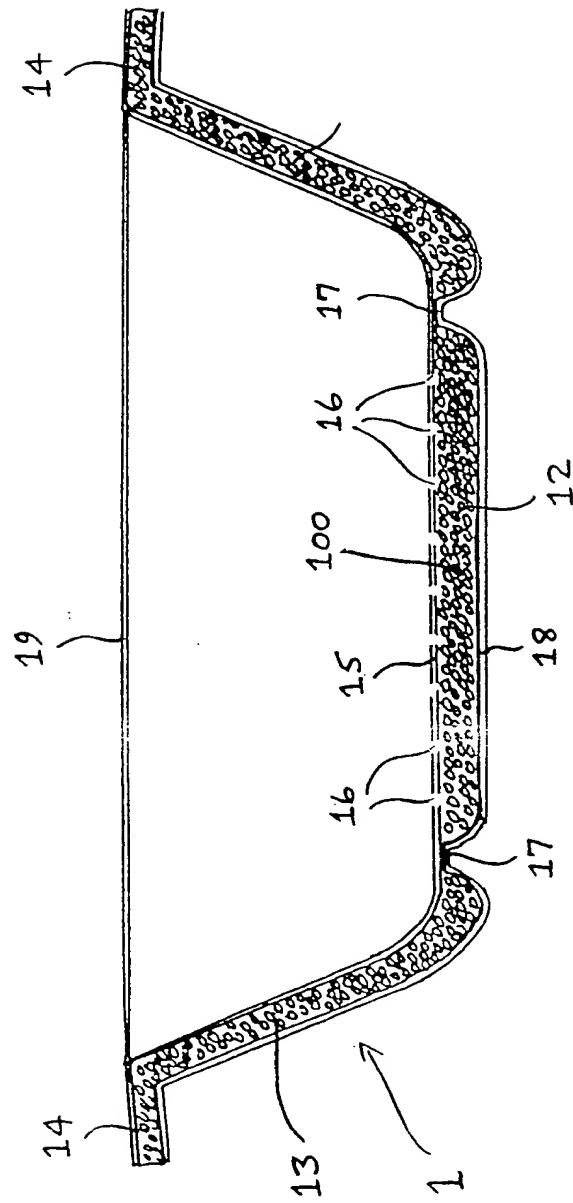


FIGURE 2

This Page Blank (uspto)

3/4

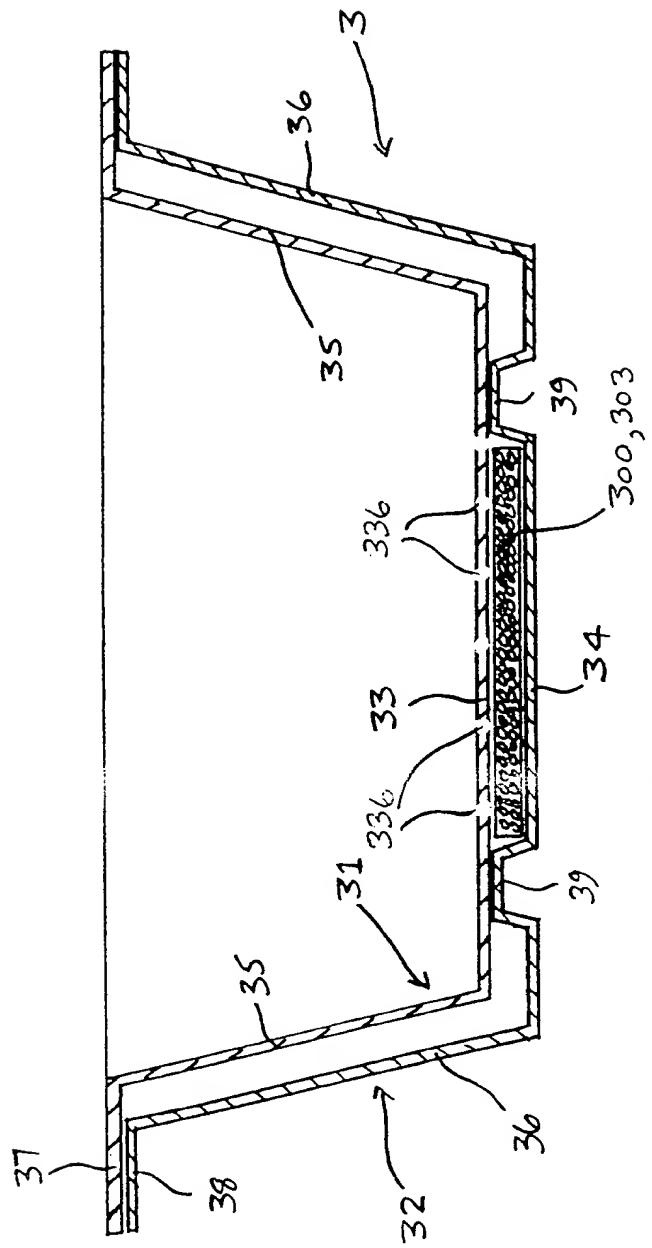


FIGURE 3

This Page Blank (uspi)

4/4

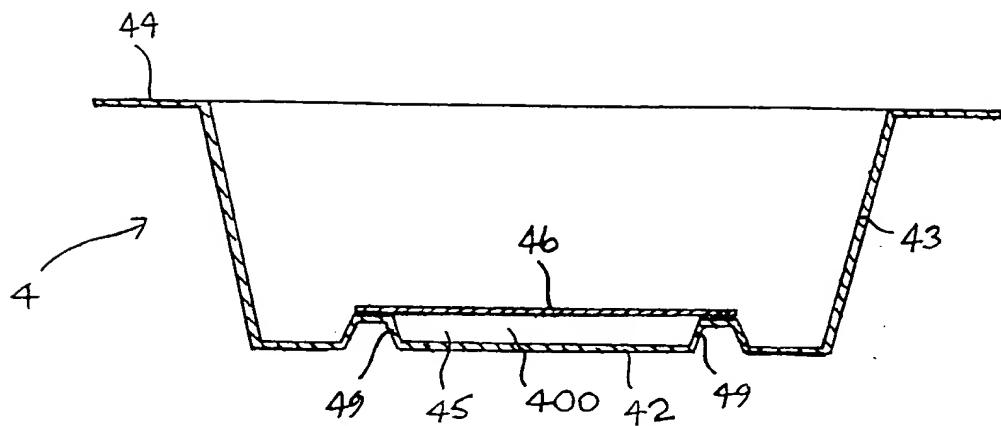


FIGURE 4

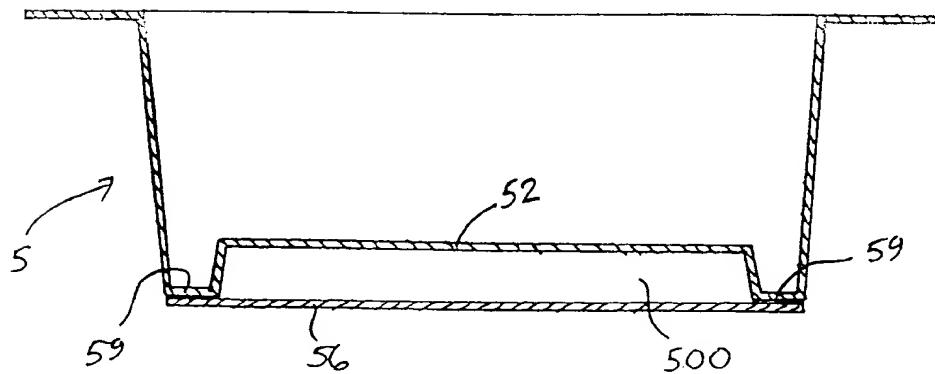


FIGURE 5

PC71413 001 00326

BR (RE) 1/16

1/31/00

This Page Blank (uspto)